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U. S. DEPARTMENT OF AGRICULTURE.

OFFICE OF EXPERIMENT STATIONS.

W. O. ATWATER, DIRECTOR.

EXPERIMENT STATION BULLETIN No. 6.

LIST OF BOTANISTS
OF THE
AGRICULTURAL EXPERIMENT STATIONS
IN THE
UNITED STATES,
WITH
AN OUTLINE OF THE WORK IN BOTANY AT THE SEVERAL STATIONS.

PUBLISHED BY AUTHORITY OF THE SECRETARY OF AGRICULTURE.

MAY, 1890.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF EXPERIMENT STATIONS,
Washington, D. C., May 1, 1890.

SIR: I have the honor to transmit herewith for publication Experiment Station Bulletin No. 6, of this Office, containing a list of the officers in charge of botanical work at the Agricultural Experiment Stations in the United States, together with an outline of this work in progress or proposed at the several stations. Such a compilation was requested by the Washington convention of the Association of American Agricultural Colleges and Experiment Stations. The present bulletin has been prepared by this Office in co-operation with a committee of station botanists appointed at that convention. Its purpose is to encourage and facilitate co-operation among the botanists of the Agricultural Experiment Stations and other investigators working in similar lines.

Respectfully,

W. O. ATWATER,
Director.

HON. J. M. RUSK,
Secretary of Agriculture.

INTRODUCTION.

The leading question asked by the botanists in attendance upon the Washington meeting of the Association of American Agricultural Colleges and Experiment Stations was: "What are other botanists doing?" And the most profitable session of the botanical workers was that in which personal experience was the topic under consideration.

With this thought in mind, and a desire to enlarge upon it so that all interested might share in the benefits arising from such knowledge, a committee was appointed to prepare a bulletin of information for botanical workers. To carry out this purpose the list of questions printed on page 6 of this bulletin was sent to the several stations, and the replies have been collated in this publication. It has been found most convenient to number the individual answers to correspond with the numbers prefixed to the questions.

At some of the experiment stations a botanist has not yet been appointed, and in such cases the questions have usually been answered by the horticulturist or director, and the replies are given in this bulletin under the name of the officer making the report. When the blanks were filled out by two or more members of a station staff it has not always been easy to arrange the replies under one set of figures. Whenever a station had a botanist, the information furnished by any other officer has been merged with that given by the botanist. In one instance where the station had two botanists, with distinct lines of work, the report of each of these officers is given under his own name, that of the second including statements regarding portions of work in horticulture which are largely botanical. As the report of the names of assistants in botanical work at the stations was very incomplete, it was deemed best to omit all reference to these workers.

While the committee is not unmindful of the incompleteness of this preliminary bulletin, it is hoped that it will give some of the information desired by the station botanists and serve to stimulate that hearty co-operation so important, if not absolutely essential, in many lines of investigation.

BYRON D. HALSTED,
F. LAMSON SCRIBNER,
B. T. GALLOWAY,
Committee.

CIRCULAR OF INQUIRY TO BOTANISTS OF AGRICULTURAL EXPERIMENT STATIONS.

QUESTIONS.

1. What botanical problems appear to you to be of most immediate importance in your State?

2. Are you making plat experiments upon forage plants (especially the grasses) or upon other economic plants, with a view to their improvement or introduction? If so, upon what plants?

3. Are you experimenting in cross-fertilization and hybridization in the hope of obtaining better knowledge of the laws that underlie these processes?

4. Are you making a study of the influence of environment (soil, climate, seed treatment, etc.) upon the plant?

5. Are you making a special study of fungous diseases?

6. Are you prosecuting investigations upon the physiology of plants?

7. Are you making an herbarium of economic plants?

8. What will you have for exchange with fellow botanists?

9. Please indicate as far as may be what will be your leading work for next year, and what is the nature of the assistance you most desire from other botanists.

10. What lines of botanical work not referred to in the above questions are you prosecuting?

LIST OF OFFICERS HAVING BOTANICAL WORK IN CHARGE AT THE AGRICULTURAL EXPERIMENT STATIONS IN THE UNITED STATES, WITH AN OUTLINE OF THIS WORK AT THE SEVERAL STATIONS.

The following statements regarding the work in botany at the several agricultural experiment stations in the United States are in the form of answers to the questions in the circular of inquiry on page 6. The numbers of the answers correspond to those of the questions.

ALABAMA.

Agricultural Experiment Station of the Agricultural and Mechanical College of Alabama.

Department of the Agricultural and Mechanical College of Alabama.
Location, Auburn. Director, J. S. Newman.
Botanist, P. H. Mell, M. E., Ph. D.

1. Problems relating to (1) injurious weeds; (2) native woods, extent of growth and relative values; (3) wild plants of the State, with reference to their value as feeding stuffs.

2. Some work has been done on wood plants native to Alabama. An arboretum has been started and is now two years old. Some work with wild grasses is contemplated for next season.

3. Plans have been made for this work.

4. Yes.

5. This subject is treated by the biologist of the Station.

6. Yes.

7. Yes.

8. A number of Alabama plants.

9. The subjects indicated under 1. Sections of native woods are being made for examination under the microscope to determine their economic values.

Southeast Alabama Agricultural Experiment Station.

Location, Abbeville. Director, T. M. Watlington, B. S.

Botanical work at this Station has just been commenced.

Plat experiments will be conducted this year on a small scale, but not with grasses.

ARKANSAS.

Arkansas Agricultural Experiment Station.

Department of Arkansas Industrial University.

Location, Fayetteville. Director, A. E. Menke, D. Sc.

Botanist, E. S. Richman, B. S.*

1. (1) Various diseases of cotton called "blight;" (2) bitter rot of apples; (3) injuries to plants by insecticides and fungicides—causes and prevention.

2. Experiments in this line on grasses and other forage plants are being conducted at the branch station at Newport.

3. With strawberries (by horticulturist).

4. No.

5. Yes.

7. This work is contemplated for the coming season.

8. Fungi.

9. The subjects indicated in 1., chiefly the third.

COLORADO.

Agricultural Experiment Station.

Department of the State Agricultural College.

Location, Fort Collins. Director, Charles L. Ingersoll, M. S.

Botanist, Charles S. Crandall, M. S.

1. Problems relating to (1) grasses and forage plants; (2) the effects of irrigation upon plants; (3) the Geneva Astragalus and Oxytropis.

2. One hundred species of grasses and forage plants.

3. Plans for future work are being made.

4. In connection with the plants under experiment.

5. Only of those injurious to the gardens and orchards of this State.

6. Yes.

7. Yes.

8. Material will be provided for exchange.

9. The special work of the year will be upon grasses.

CONNECTICUT.

The Connecticut Agricultural Experiment Station.

Location, New Haven. Director, Samuel W. Johnson, M. A.

Mycologist, Roland Thaxter, Ph. D.

2. These experiments are conducted by the vice-director, E. H. Jenkins, Ph. D.

5. Yes.

7. Only of local fungi. This Station owns an extensive phanerogamic herbarium.

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* Now of Agricultural Experiment Station of Utah.

DELAWARE.

The Delaware College Agricultural Experiment Station.

Department of Delaware College.

Location, Newark. Director, Arthur T. Neale, Ph. D.

Botanist, Frederick D. Chester, M. S.

1. Problems relating to (1) the biology of peach yellows; (2) the use of fungicides; (3) black rot and dry rot of the sweet potato.

2. The Station has a grass garden, but the most important tests are made with alfalfa, esparsette, serradella, sand lucem (*Medicago media*), vetch, lupine, and scarlet clover (*Trifolium incarnatum*).

3. This work is mainly done by the horticulturist.

4. This work is shared by the different departments of the Station.

5. This is the main work of the botanist. The Station has a small glass house especially designed for the purpose. The study of bacteriology is also a specialty.

6. On the functions of the root tubercles of leguminous plants.

7. Yes.

8. *Cercospora helvola* (Sacc.), on scarlet clover; *Cercospora helvola*, var. *medicaginis*, on alfalfa; *Cystopus convolvulacearum*, on sweet-potato.

9. Extensive individual and co-operative experiments in the treatment of plant diseases, especially black and dry rot of the sweet potato, and an alfalfa disease (*Phacidium medicaginis*).

10. Study of the ferments in silage, and the biological conditions affecting the production of sweet and sour silage. The black spot of apples will also be investigated.

FLORIDA.

Agricultural Experiment Station of Florida.

Department of Florida State Agricultural and Mechanical College.

Location, Lake City. Director, Rev. J. P. De Pass.

Botanist, James C. Neal, Ph. D., M. D.

1. The originating of (1) an orange, hardy as the Satsuma, not dwarf, nor with "loose-nuded" fruit; (2) a peach that will bloom after February 20, and be as early as the "Honey;" (3) a "bunch-fruited" Scuppernong grape; (4) a cotton yielding 50 pounds of lint to the 100 pounds of "seed cotton;" (5) a cotton yielding 10 pounds of lint to the 100 pounds of seed cotton.

2. Grasses from Southern Europe, Northern Africa, and Japan.

3. With the peach and orange.

4. Not at present.

5. Only incidentally.

6. Not at present.

7. This work has just been undertaken.

8. Florida plants, especially grasses.

10. The investigation of orange blight and root rot.

GEORGIA.

Georgia Experiment Station.

Department of State College of Agriculture and Mechanic Arts, University of Georgia.
Location, Experiment. Director, R. J. Redding.
Horticulturist, Gustave Speth.

2. Forage plants belonging to the sorghum family; fibrous plants, ramie, jute, okra, etc.

3. Yes.

4. Yes.

5. Those of fruit trees, small fruits, and sweet potatoes.

7. Yes.

8. Nothing as yet.

10. The study of Japanese fruits, with reference to their introduction and nomenclature.

ILLINOIS.

Agricultural Experiment Station of the University of Illinois.

Department of the University of Illinois.
Location, Champaign. Director, Selim H. Peabody, Ph. D., LL. D.
Botanist, T. J. Burrill, Ph. D.

1. Problems relating to (1) parasitic diseases; (2) vegetable physiology, especially fertilization and breeding.

2. To a limited extent with grasses and clovers. The intention is to extend this work.

3. This work is made a specialty.

4. Not directly.

5. Especially bacterial diseases.

6. Specifically only in the line of crossing and breeding.

7. This work has been undertaken. The Station already has a considerable collection of native and introduced plants.

8. Very little at present.

9. The study of bacterial diseases of plants; crossing and hybridizing.

INDIANA.

Agricultural Experiment Station of Indiana.

Department of Purdue University.
Location, La Fayette. Director, Horace E. Stockbridge, Ph. D.
Botanist, J. C. Arthur, Sc. D.

2. Potatoes, to test the relation of the seed tuber to the harvest.

3. Work is in progress to determine the influence of the pollen on the offspring, especially in the production of double flowers.

5. Wheat rust and smut have so far received most attention.

6. Injurious effects of cold weather, and some problems in plant heredity.

7. Such a collection is contemplated, but it is barely begun at present.

8. Pure cultures of living bacteria upon agar-agar, especially of such

species as produce diseases of plants, or are otherwise of botanical interest.

Wanted—Information regarding the prevalence and distribution of the bacterial diseases of carnations; the occurrences of pear blight west of the Rocky Mountains; and any printed notice of pear blight dated earlier than 1800.

9. Investigations on (1) the relations of the size of the seed to the yield; (2) several questions regarding the preparation and planting of seed tubers of the potato; (3) bacterial diseases of pears, carnations, and other plants; (4) certain fungous diseases and their treatment; (5) the occurrence and identification of the edible fungi of Indiana.

IOWA.

Iowa Agricultural Experiment Station.

Department of Iowa State College of Agriculture and Mechanic Arts.
Location, Ames. Director, R. P. Speer.
Botanist, L. H. Pammel, B. Agr.

1. Problems relating to (1) the improvement of tree fruits, cereals, and grasses by cross fertilization and selection; (2) fungous diseases of plants; (3) conditions underlying plant growth and reproduction.
2. Special attention is being given to the improvement of corn. A large number of varieties of wild grasses from Iowa, Minnesota, Montana, Idaho, and Colorado are being tested.
3. To a limited extent.
4. Especially with different kinds of fruit.
5. Attention has been given to fire blight of fruit trees. The study of "root-rot" will be a specialty.
6. Not at present.
7. To some extent.
8. Fungi, grasses, and some hardy Russian plants.
9. (1) The improvement of tree fruits and field crops by cross-fertilization and selection; (2) a spot disease of the plum.

Wanted—Information regarding the "corn-stalk" disease of cattle.

10. Microscopical study of seeds and questions relating to the adulteration of food.

KANSAS.

Kansas Agricultural Experiment Station.

Department of Kansas State Agricultural College.
Location, Manhattan. Geo. T. Fairchild, A. M., Chairman of Council.
Botanist, Wm. A. Kellerman, Ph. D.

1. Problems relating to (1) fungous diseases of plants; (2) non-parasitic diseases of plants; (3) weeds of the State; (4) grazing plants.
2. Only in connection with the cross-fertilization of corn.
3. With Indian corn.
4. No.
5. Yes.
6. Only so far as is implied in studies in vegetable pathology.

7. Yes.

8. Fungi; crossed corn.

9. Experiments with fungicides; study of rusts, smuts, and other parasitic diseases, especially of the grape, grasses, cereals, and fruit-trees; study of crossed corn.

Wanted—To exchange specimens of economic fungi and notes regarding the same.

10. Weeds, their distribution and eradication; origination of new varieties of corn by cross-fertilization.

KENTUCKY.

Kentucky Agricultural Experiment Station.

Department of the Agricultural and Mechanical College of Kentucky.
Location, Lexington. Director, M. A. Scovell, M. S.
Botanist, H. Garman.

1. Problems relating to (1) plant diseases and parasites, including remedies; (2) forage plants.

2. This work is in charge of the agriculturist of the Station.

3. No.

4. As far as it concerns the special object of investigation.

5. Yes.

6. No special work of this kind has been undertaken.

7. Yes.

8. Fungi.

9. The investigation of certain parasitic fungi.

LOUISIANA.

No. 1.—Sugar Experiment Station, Audubon Park, New Orleans.
No. 2.—State Experiment Station, Baton Rouge.
No. 3.—North Louisiana Experiment Station, Calhoun.
Department of Louisiana State University and Agricultural and Mechanical College.
Director, Wm. C. Stubbs, Ph. D. Botanist, A. T. Prescott, B. S.

Botanical work has just been undertaken at the State Experiment Station. Plat experiments with forage plants are already in progress, and it is intended that all the lines of work indicated in the circular of inquiry shall receive attention.

No work in botany has yet been undertaken by the other stations in this State.

MAINE.

Maine State College Agricultural Experiment Station.

Department of State College of Agriculture and the Mechanic Arts.
Location, Orono. Director, Whitman H. Jordan, M. S.
Agriculturist, Walter Balentine, M. S.

1. Problems relating to (1) testing varieties and seeds; (2) plant nutrition; (3) fungous diseases; (4) weeds and their suppression. The formation of a reference herbarium of economic plants is also very desirable.

2. Yes. The varieties tested will be stated in detail in the Annual Report of the Station for 1889.

3. Nothing in this line has been undertaken as yet.

4. Yes.

5. Yes.

6. Physiological and pathological investigations have been made.

7. Yes.

8. Grasses and other forage plants; fungi; other phenogams and cryptogams from plants of economic importance.

9. Fungous diseases; testing of varieties of forage plants; potato scab; germination and plat tests of seeds; weeds.

10. Testing of fungicides; germination of seeds.

The Professor of Agriculture is conducting a series of pot experiments on plant nutrition; also tests of varieties of cereals and farm crops. Work on orchard and small fruits has also been undertaken.

MARYLAND.

Maryland Agricultural Experiment Station.

Department of Maryland Agricultural College.

Location, Agricultural College P. O. Director, Henry E. Alvord, C. E.
Horticulturist, W. H. Bishop, B. S.

1. Problems relating to (1) fungous diseases of plants; (2) the influence of latitude on seeds and plants.

2. The "forage garden," containing grasses and other forage plants, is in charge of the agriculturist.

3. No.

4. This question will be considered in connection with other work.

6. No.

7. No.

9. The study of the tomato.

10. The work is at present more horticultural than botanical, but will be further developed in the latter direction.

MASSACHUSETTS.

Hatch Experiment Station of the Massachusetts Agricultural College

Department of the Massachusetts Agricultural College.

Location, Amherst. Director, Henry H. Goodell, M. A.
Horticulturist, S. T. Maynard, B. S.

1. Investigations to determine whether the variations of seedling fruits, vegetables, etc., from the original types are due to the influence of the pollen used, or to changes which take place in the embryo before the act of fertilization.

2. Grasses, fruits, ornamental trees, shrubs, and plants.

3. Yes; to determine the influence of the pollen upon the quality of the fruit or its covering or receptacle.

4. Yes.

5. With special reference to the best means of their destruction or prevention.

6. Only to a limited extent.

7. Yes.

8. No duplicates have been made as yet.

9. Problems indicated above. Specimens of parasitic fungi are desired.

Massachusetts State Agricultural Experiment Station.

Location, Amherst. Director, Chas. A. Goessmann, Ph. D., LL. D.

2. Grasses, leguminous plants, vetch, serradella, soja bean, Southern cow pea, and sanfoin.

3. Yes.

5. The work of the vegetable pathologist, J. E. Humphrey, B. S., is almost wholly in this line.

6. In the field and vegetation house.

7. Yes.

8. Nothing at present.

9. (1) The arranging of orchards and vegetation house; (2) the investigation of one or two fungous diseases, especially the black knot of plums.

MICHIGAN.

Experiment Station of Michigan Agricultural College.

Department of Michigan Agricultural College.

Location, Agricultural College. Director, Oscar Clute, M. S.

Botanist, Wm. J. Beal, Ph. D.

1. Problems relating to (1) injurious fungi; (2) bacteria; (3) tests of grass seeds in the market; (4) plants for the "Jack-pine" lands of the State.

2. Grasses, clovers, and other forage plants, with a view to the selection and improvement of timothy, June grass, orchard grass, meadow fescue, redtop, etc.

3. In crossing and selecting wheat; crossing with foreign stock after Darwin.

4. To some extent.

5. To a limited degree.

6. Chiefly in connection with courses of instruction in the college.

7. Yes.

8. Chiefly grasses, but also some fungi.

9. The following lines of work are contemplated: (1) Experiments in five different counties on the pine plains, including visits to them several times a year; tests of grasses and other forage plants; tests of fertilizers; determination of the most economical way of cultivating the wild land; in one place experiments with forest trees; studies on the distribution of wild plants and on fungi to some extent. (2) Incidentally, the raising of seedlings of wild asters, golden-rods, and wild sun-

flowers at the college for information as to the limit of species. (3) Tests of old permanent pasture-land as compared with recently seeded land for the profitable growth of crops. (4) Tests of forest trees and shrubs at the college.

MINNESOTA.

Agricultural Experiment Station of the University of Minnesota.
Department of the University of Minnesota.
Location, St. Anthony Park. Director, N. W. McLain, LL. B.
Botanist, Otto Lugger, Ph. D.

1. Problems relating to (1) the diseases of useful plants, and (2) varieties of cereals and grasses with reference to their adaptability to the different parts of the State.

2. With forage plants by the divisions of agriculture and botany.

3. A few experiments have been made.

4. No.

5. Yes.

6. Only in connection with entomological work.

7. Yes, and also one of all native plants.

8. The Station will have weeds for exchange, but not at present. Several collections of native plants are made at the expense of the State, and it is deemed unnecessary to duplicate this work.

9. It is now expected to undertake the study of native grasses.

Wanted—Specimens of grasses.

10. The adaptability of different varieties of wheat to this State. The identification of specimens of plants received from farmers who request information about them.

MISSISSIPPI.

Mississippi Agricultural Experiment Station.
Department of Mississippi Agricultural and Mechanical College.
Location, Agricultural College. Director, S. M. Tracy, M. S.
Horticulturist, B. W. Saffold, B. S.

1. Problems relating to (1) the variations in the nutritive value of plants caused by change of climate; (2) fungous diseases affecting cotton.

2. Grasses and forage plants, for the most part.

4. Yes.

5. Those affecting cotton.

6. No.

7. Yes.

8. Grasses and forage plants; sedges; fungi.

9. The production of improved species of grasses by the selection of plants which most nearly approach the desired type; development of fungus-resisting varieties of cotton.

10. A botanical survey of the State, including soil characteristics as indicated by the natural vegetation.

NEBRASKA.

Agricultural Experiment Station of Nebraska.

Department of the Industrial College of the University of Nebraska.
Location, Lincoln. Director, L. E. Hicks, Ph. D.
Botanist, Chas. E. Bessey, Ph. D.

1. Problems relating to (1) native grasses, with reference to their economic value; (2) cultivated grasses to determine what varieties may be grown on the plains; (3) plant diseases.
2. Native and cultivated grasses, clovers, alfalfa, etc.
3. No.
4. No.
5. Yes.
6. To a limited extent.
7. Yes, in addition to the University herbarium.
8. Native grasses and parasitic fungi, probably.
9. The chief work in view is indicated under 1. Grasses and seeds are desired.

NEVADA.

Nevada Aricultural Experiment Station.

Department of Nevada State University.
Location, Reno. Director, S. A. Jones, Ph. D.
Botanist, F. H. Hillman, B. S.

1. Problems relating to (1) the establishment of grasses and forage plants capable of enduring the dry climate of Nevada; (2) the forestry of the State.
2. This work is contemplated, but not yet established.
3. No.
4. Work in this line is contemplated.
5. No.
6. No.
7. Yes, and also one of the flora of Nevada in general.
8. Specimens of the general flora of Nevada; and, it is hoped, of the native grasses especially.
9. The collection and study of wild plants, especially grasses.

NEW HAMPSHIRE.

New Hampshire Agricultural Experiment Station.

Department of New Hampshire College of Agriculture and the Mechanic Arts.
Location, Hanover. Director, G. H. Whitcher, B. S.
Botanist, H. H. Lamson, M. D.

1. Problems relating to (1) the improvement of seeds of staple crops; (2) the effect of fertilizers on the composition of crops.
2. Leguminous plants.
3. No.

4. With potatoes.
5. No.
6. Only as regards the effect of chemical fertilizers on the composition of plants.
7. Yes.
8. The Station has nothing to exchange at present.
9. (1) Study of leguminosæ: (2) tests of varieties of potatoes from seed obtained from various localities.

NEW JERSEY.

New Jersey Agricultural College Experiment Station.

Department of Rutgers College.
Location, New Brunswick. Director, M. E. Gates, LL.D.
Horticulturist and Botanist, Byron D. Halsted, Sc. D.

1. Problems relating to (1) the fungi injurious to crops, especially those grown by horticulturists and truckmen; (2) the physiological laws underlying plant breeding, as connected with the improvement of old varieties and the production of better ones.
2. It is the intention to experiment with forage plants (especially grasses) to determine those that will thrive upon, and render productive, a part of the waste or so-called "barren land" of the State.
3. The subject of pollen is receiving considerable attention as an underlying factor in cross-fertilization and hybridization, sterility being often due to impotent pollen.
4. Experiments are being made to determine the most favorable conditions for the growth of crops, especially in the earlier stages. This includes character of seed, position and depth in soil, etc.
5. Fungi affecting some particular plant are selected each year for special treatment. During 1889 the fungi injurious to the cranberry have been chiefly considered.
6. Examinations of the storage of starch and other reserve food material in fruit-trees are in progress. The influence of winter temperatures upon vitality of fruit buds, especially those of the peach, has been considered.
7. Principally of injurious fungi, weeds, and weed seeds.
8. Injurious fungi, weeds, and weed seeds.
9. A continuation of the investigation of the fungi of the cranberry, with remedies; the fungi of pomaceous fruits. Field experiments upon sweet-potato rots.

Wanted—Ergots upon various grasses; information upon weeds generally, and specimens of any new and rare sorts.

10. The study of plants, flowering and otherwise, that are poisonous (by touch or taste) to man and the higher animals, *e. g.*, rhus, strawberry fruit (to some persons), wild parsnips, etc.

NEW YORK.

New York Agricultural Experiment Station.

Location, Geneva. Director, Peter Collier, Ph. D.

1. The investigation of native grasses.
2. Prickly comfrey, alfalfa, sorghum, and several other forage plants.
3. To a limited extent.
4. Not extensively at present.
5. Only those of local interest.
6. On a limited scale.
7. A partial one.
8. Such materials as are on hand.
9. Assistance of any kind will be welcomed.

Cornell University Agricultural Experiment Station.

Department of Cornell Univerity.

Location, Ithaca. Director, I. P. Roberts, M. Agr.

I. Botanist, Albert N. Prentiss, M. S.

1. Problems in plant pathology and physiology; and in forestry in its wider relations to botany.

2. Grasses and *Compositæ* (mainly for comparison); fruits and vegetables, especially the *Solanaceæ* and *Cucurbitaceæ*.

3. Yes.

4. In connection with studies in plant physiology.

5. This is the only subject at present receiving attention from this department of the Station.

6. To some extent in connection with University courses of instruction.

7. The herbarium, already of considerable size, is being gradually enlarged.

8. Nothing will be specially prepared for this purpose, but exchanges may be arranged by correspondence. Duplicates of all garden plants are made.

10. Work in phanerogamic botany and plant physiology is at present only incidentally done in connection with the Station.

II. Cryptogamic Botanist, Wm. R. Dudley, M. S.

1. Problems in economic cryptogamic botany: (1) fungous diseases of small and large fruits; (2) the various diseases of the potato and the relative injury occasioned by each; (3) a disease of wheat new to America; (4) diseases of the grapes of central New York.

2. No.

3. No.

4. No.

5. Yes.

6. Incidentally on fungi.

7. This work has been begun. Specimens of parasitic fungi are solicited.

8. Parasitic fungi, chiefly *Uredineæ*, *Ustilagineæ*, and *Peronosporæ*, but also a considerable number of miscellaneous species.

9. The biology of *Entomosporium maculatum*, *Uromyces trifolii*, and *Glœosporium ribis;* and a study of the *Cladosporium* disease of wheat. Information is desired concerning the appearance, prevalence, destructiveness, etc., of the above-mentioned fungi; with specimens from different parts of the State.

10. Information relating to the origin, prevalence, and destructiveness of fungous diseases in the State is being collected by correspondence and otherwise.

NORTH CAROLINA.

North Carolina Agricultural Experiment Station.

Location, Raleigh. Director, H. B. Battle, Ph. D.
Botanist, Gerald McCarthy, B. S.

1. Problems relating to (1) the best grasses and forage plants for North Carolina; (2) the plants most valuable for sowing in fallow fields and between cultivated crops when "laid by," to prevent the growth of weeds and furnish green manure; (3) fungous diseases of cultivated plants.

2. Forty-two species of grasses and clovers, including the best known and most promising varieties.

3. No.

4. The study of environment has not been undertaken except as indicated in 2.

5. Very little attention has been given to fungi, but more of this work is contemplated.

6. Experiments are being made with leguminous plants to ascertain their power of fixing free nitrogen; also extensively with seeds with reference to a reliable standard of quality.

7. The Station has a small herbarium of grasses and phanerogams of the Southern flora. The intention is to restrict the collection to economic plants.

8. The Station is prepared to exchange specimens of staple Southern crops, and, to some extent, local fungi. Fungi of economic importance are desired.

9. The chief work for 1890 is the study of grasses and seeds.

10. A study of weeds from an economic stand-point; and the relation of different chemical fertilizers to diseases of cotton.

OHIO.

Ohio Agricultural Experiment Station.

Location, Columbus. Director, Chas. E. Thorne.
Botanist, Clarence M. Weed, M. S.

1. Problems relating to fungous diseases.

2. Not at present. Such experiments are being made with grasses by the agriculturist, and with certain other economic plants by the horticulturist.

3. Special experiments in cross-pollinization and hybridization are in progress.

4. To some extent. The most important work in this line is a study of Northern and Southern seeds.

5. Especially as regards preventive treatment.

7. Yes, and also of all others.

8. Parasitic fungi.

9. (1) Remedies for fungous diseases, with a special view to combination of insecticides and fungicides; (2) botanical survey of Ohio; (3) collecting for herbarium.

Wanted—Herbarium specimens of every kind.

10. Studies relating to (1) the amount of heat seeds will endure without injury to germinating quality; (2) various aquatic plants; (3) the biological relations of insects and plants.

OREGON.

Oregon Experiment Station.

Department of Oregon State Agricultural College.
Location, Corvallis. Director, E. Grimm, B. S.
Botanist, E. R. Lake, M. S.

1. A systematic study of the flora of the State.
2. Grasses, clovers, legumes generally, and novelties.
3. Not at present.
4. No.
5. This work has just been undertaken.
6. No.
7. Yes, a general one.
8. Grasses, clovers, and other legumes. Fungi.
9. The chief line of work in view is indicated under 1.

Wanted—Fungi by exchange.

10. Improvement of florists' plants by cross-fertilization.

PENNSYLVANIA.

The Pennsylvania State College Agricultural Experiment Station.

Department of the Pennsylvania State College.
Location, State College, Centre Co. Director, H. P. Armsby, Ph. D.
Botanist, William A. Buckhout, M. S.

The botanist of the Station is chiefly engaged in college instruction. The problems considered of special importance are forestry and fungous diseases of plants.

SOUTH DAKOTA.

South Dakota Agricultural Experiment Station.

Department of South Dakota Agricultural College,
Location, Brookings. Director, Lewis McLouth, Ph. D.
Botanist, Charles A. Keffer.

1. Problems relating to (1) the identification of native grasses; (2) the general flora of the State; (3) improvement of native plums.

2. This work is under the control of the department of agriculture of the Station.
3. This work is in view for the future.
4. No.
5. No.
6. To a limited extent.
7. Yes.
8. The Station now has for exchange two hundred species of native plants of Dakota and will largely increase its list the coming season.
9. Herbarium work, especially on grasses, compositæ, and leguminosæ, and general systematic work. Information regarding the above-named orders of plants is desired.

TENNESSEE.

Tennessee Agricultural Experiment Station.

Department of the University of Tennessee.
Location, Knoxville. Director, Charles W. Dabney, jr., Ph. D., LL. D.
Botanist, F. Lamson Scribner, B. S.

1. Problems relating to (1) fungous diseases of plants; (2) forage plants.
2. Forage plants with seeds obtained from seedsmen.
3. No.
4. Not especially.
5. Incidentally.
6. No.
7. Yes, of grasses, and also a general herbarium.
8. The native plants of the State.
9. Investigation of the grasses of the State and the preparation of a report thereon.

Wanted—Seeds of native grasses of the far West and Southwest.

TEXAS.

Texas Agricultural Experiment Station.

Department of Agricultural and Mechanical College of Texas.
Location, College Station. Director, F. A. Gulley, M. S.
Botanist, T. L. Brunk, B. S.

1. Problems relating to (1) the hybridization of the grape; (2) fungous diseases; (3) native plums, especially their cross-fertilization.
2. Tests have been made with fifty-three varieties of forage plants.
3. Yes.
4. Incidentally.
5. A collection of fungi is being made.
6. No.
7. Yes.
8. Fungi, Texas grasses, and other wild plants.
9. *Wanted*—A full set of specimens of indigenous plums.

VERMONT.

Vermont State Agricultural Experiment Station.
Department of University of Vermont.
Location, Burlington. Director, W. W. Cooke, M. A.
Horticulturist, C. W. Minott, B. S.

1. Problems relating to (1) a systematic study of both natural and introduced grasses: (2) fungous diseases, especially those affecting the potato and pear.

2. On grasses with reference to their adaptability to the climate of the State. Special attention will be given to the most promising millets for this section.

3. Yes.

4. On millets and bush fruits generally.

5. This work is contemplated for the immediate future.

6. Some attention will be given to this work.

7. Yes.

8. Grasses, in the near future.

9. Special attention will be given to fungous diseases and any help on this subject will be gratefully received.

VIRGINIA.

Virginia Agricultural and Mechanical College Experiment Station.
Department of Virginia Agricultural and Mechanical College.
Location, Blacksburg. Director, W. B. Preston.
Botanist, Wm. B. Alwood.

1. Problems relating to the treatment of fungous diseases, especially the black-rot of grapes, scab of apples, and black knot of plums, with a view to working out the exact details of the best methods.

2. Grapes, strawberries, blackberries, whortleberries, and tomatoes. Other work of this nature is contemplated. Nothing has been done as yet with grasses.

3. Not at present.

4. The special treatment of plants as to culture and fertilizers is being studied. Widely cultivated varieties from various sources are being grown side by side for comparison.

5. The study of the practical details of the application of remedies is contemplated.

6. No.

7. To a small extent.

8. Very little at present.

9. The special work in botany will be on fruits and vegetables, as above indicated, and on fungicides.

Wanted—Specimens of economic fungi, grasses, and species of the fruits mentioned.

WEST VIRGINIA.

West Virginia Agricultural Experiment Station.
Department of West Virginia University.
Location, Morgantown. Director, John A. Myers, Ph. D.
Botanist, C. F. Millspaugh, M. D.

1. The botanical work of this Station has just been undertaken. The study of forage plants will probably be the chief line of work.

2. The Station has no grounds as yet.

7. Yes.

8. Flora of West Virginia as collected.

9. The study of forage plants and grasses.

Wanted—To exchange seeds and plants of different species of herbs.

WISCONSIN.

Agricultural Experiment Station of the University of Wisconsin.
Department of University of Wisconsin.
Location, Madison. Director, W. A. Henry, B. Agr.
Horticulturist, E. S. Goff.

1. The Station has no botanist, but the work of the horticulturist, as far as it is allied with that of a botanist, is stated below.

2. To a slight extent with forage plants.

3. Incidentally.

4. To some extent, so far as the selection of seeds and cuttings is concerned, *e. g.*, influence of immature seeds and seeds from diseased plants, and of cuttings, with respect to vigor.

6. With reference to the influence of temperature and light upon the changes that take place in the potato tuber during storage.

7. Of the smaller forage plants.

8. The Station has no duplicates at present, but could prepare specimens of the more common forage plants.

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